REMARKS

I. INTRODUCTION

In response to the Office Action dated June 6, 2005, please consider the following remarks. Claims 1-48 remain in the application. Entry of these amendments, and re-consideration of the application, as amended, is requested.

II. CLAIM AMENDMENTS

Applicants' attorney has made amendments to the claims as indicated above. These amendments were made solely for the purpose of clarifying the language of the claims, and were not required for purposes of patenability.

III. STATUS OF CLAIMS

Claims 1-48 are pending in the application.

Claims 1-3, 5-9, 12, 14-16, 18-21, 23, 25, and 28-48 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,061,562 to Martin et al. (Martin) in view of U.S. Patent No. 2,598,064 to Lindenblad, and these rejections are being appealed.

Claim 13 was rejected under 35 U.S.C. §103(a) as being unpatentable over Martin in view of U.S. Patent No. 6,377,802 to McKenna et al. (McKenna), and further in view of U.S. Patent No. 6,570,858 to Emmons Jr. et al., and these rejections are being appealed.

Claims 10, 17, 22, and 26-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Martin in view of U.S. Patent No. 6,157,621 to Brown, and these rejections are being appealed..

Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Martin in view of Brown, and further in view of U.S. Patent No. 6,339,611 to Antonio et al. (Antonio), and these rejections are being appealed.

Claims 4 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Martin and Lindenblad in view of U.S. Patent No. 4,797,677 to MacDoran et al. (MacDoran), and these rejections are being appealed.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been made subsequent to the final Office Action.

V. ISSUES PRESENTED FOR REVIEW

Whether claims 1-3, 5-9, 12, 14-16, 18-21, 23, 25, and 28-48 are patentable over U.S. Patent No. 6,061,562 to Martin et al. (Martin) in view of U.S. Patent No. 2,598,064 to Lindenblad under 35 U.S.C. §103(a);

Whether claim 13 is patentable over Martin in view of U.S. Patent No. 6,377,802 to McKenna et al. (McKenna), and further in view of U.S. Patent No. 6,570,858 to Emmons Jr. et al. under 35 U.S.C. §103(a);

Whether claims 10, 17, 22, and 26-27 are patentable over Martin in view of U.S. Patent No. 6,157,621 to Brown under 35 U.S.C. §103(a);

Whether claim 11 is patentable over Martin in view of Brown, and further in view of U.S. Patent No. 6,339,611 to Antonio et al. (Antonio) under 35 U.S.C. §103(a); and

Whether claims 4 and 24 are patentable over Martin and Lindenblad in view of U.S. Patent No. 4,797,677 to MacDoran et al. (MacDoran) under 35 U.S.C. §103(a).

VI. GROUPING OF CLAIMS

The rejected claims do not stand or fall together. Each claim is independently patentable. Separate arguments for the patentability of each claim are provided below.

VII. ARGUMENTS

A. The Independent Claim 1 Is Patentable Over The Prior Art

Claim 1 was rejected as unpatentable over U.S. Patent No. 6,061,562, issued to Martin, in view of U.S. Patent No. 2,598,064, Issued to Lindenblad. The Applicants respectfully traverse this rejection.

1. The Martin Reference

U.S. Patent No. 6,061,562, issued May 9, 2000 to Martin discloses a communication system that includes an aircraft supporting an airborne switching node that provides communication services to a variety of ground-based devices located in the service region. The devices include subscriber devices, such as customer premises equipment and business premises equipment, as well as gateway devices.

2. The Lindenblad Reference

U.S. Patent No. 2,598,064, issued May 27, 1952 to Lindenblad discloses an air-borne radio relaying system.

3. Independent Claim 1 is Patentable Over the Martin and Lindenblad Reference

Claim 1 recites

> *A communications system, comprising:*
> *a gateway, communicatively coupleable to a terrestrially-based network;*
> *a plurality of communications platforms, each of the plurality of communications platforms disposed in a stratospheric location, for transponding information between at least one of a plurality of user terminals and the gateway, wherein the plurality of communications platforms travels on a path having a radius D and wherein a distance between each platform is approximately 8.6D.*

According to the Office Action, the Martin reference discloses all of the features of claim 1, and that one of ordinary skill in the art would be motivated to modify the Martin reference as described in the Lindenblad reference to set the distance between each platform at approximately 8.6D wherein D is the radius of the path in which the communications platforms are traveling.

This is incorrect for at least three reasons. First, the Martin reference does not teach a transponder. Second, the Lindenblad reference does not teach that the distance between platforms is approximately 8.6 times the radius of the path that the communications platforms are traveling. Finally, third, there is no teaching to combine the Martin and Lindenblad references.

a) Martin Does not Teach Communications Platforms that <u>Transpond</u> Information

In previous communications, the Applicants have pointed out that the Martin reference does not teach a platform having a transponder. The Examiner has disagreed, stating:

> "... by definition, a transponder is a radio relay equipment on-board the aircraft in a bent pipe or relay communication system. Therefore, it is inherent within an airplane that a transponder is used to relay signals via the airplane to another destination ground station using transmiter receiver pair 166 or gateway antenna 168 (col. 8, lines 1-23) as is disclosed by Martin et al in which the aircraft acts as a relay station between gateway devices 22 (see col. 5, lines 30-42 and col. 5, lines 50-55)
>
> the aircraft receives data from gateway device 22 and retransmits the data to another gateway 22 or CPE 18 in which the aircraft 12 acts like a repeater station to route and/or relay data from an originating device to a destination device; retransmit/relay the received data from the originating device to the destination device in the cited Martin reference acting 'as a radio relay equipment on board the aircraft in a bent pipe or relay communication

system'."

The portions of the Martin et al. reference relied upon by the Examiner are reproduced below:

> In a particular embodiment, transmit/receive pairs 166 mounted on horizontal section 162 service cells 42 in center sector 44 of service area 16, whereas transmit/receive pairs 166 mounted on angled rim 164 service cells 42 in surrounding sectors 46 of service region 16. The particular arrangement of transmit/receive pairs 166 on antenna 160 shown in FIG. 4 service one central sector 44 and eight surrounding sectors 46. Each transmit/receive pair may comprise two 16.times.16, thirty inch square phased array elements. Transmit/receive pairs 166 may be added, removed, or arranged on antenna 160 in a modular fashion to provide a variety of communication capabilities. (col. 8, lines 1-22)

and

> In operation, aircraft 12 flies in an orbit 30 to maintain ASN 14 at an altitude above service center 16. The phased array antenna in ASN 14 electronically directs beams 40 to cells 42 in sectors 44 and 46 of service region 16. An originating device (e.g., CPE 18, BPE 20, gateway 22) located in a first cell 42 transmits data to ASN 14 using a first beam 40 servicing the first cell 42. A switch in ASN 14 couples the data received from the originating device to the phased array antenna for transmission to a destination device (e.g., CPE 18, BPE 20, gateway 22) located in a second cell 42 serviced by a second beam 40. In this manner, ASN 14 implements a star topology to interconnect any two devices within service region 16. (col. 5, lines 30-42)
>
> In a particular embodiment, the destination device could also be located in the same cell as the originating device. ASN 14 supports multiple subscriber channels within a given beam 40, with each channel separated by time division multiple access (TDMA), code division multiple access (CDMA), frequency division multiple access (FDMA), or other appropriate channel separation technique. For communication between subscribers in the same beam 40, ASN 14 receives packet data from the originating device in the first cell 42 and directs the packet data to the antenna for transmission to a second subscriber in the first cell 42 to allow for channel-to-channel communication within the same beam 40. (col. 5, lines 44-55).

This argument relies on both hindsight reconstruction and a misapplication of the inherency doctrine. Nothing in the foregoing discloses a "bent-pipe" or "relay" communication system. The terms "bent pipe" or "repeat" are not used in the specification at all, and the word "relay" is used in the Martin reference in an entirely different context:

> Multiplexer 102 directly couples to local area network (LAN) 104 to support video conferencing services 106. Multiplexer 102 also couples to LAN 108 using a fractional T1 connection supporting V.35 protocol and a frame ***relay*** adapter 110. (col. 7, lines 8-9, emphasis added)
>
> In operation, ASN 14 interconnects devices 100 to provide telephony and data communication, local wireless service, LAN/WAN interconnection (bridging/routing), graphical data transmission, video transmission, and connectivity with other systems, such as long-haul data networks using D4 channel bank 116 or data interface 126. ASN 14 transports frame ***relay***, LAN/WAN, T1, V.35, and other traffic using packet switching, such as ATM switching. (col. 7, lines 39-46, emphasis added)

Based upon the foregoing, there is no basis whatever for the Office Action's claim that the Martin discloses a "relay", "bent pipe", or "repeater" system or anything like it.

If, perhaps the Office Action's argument is that the system transmitting a signal from the ground to an airborne/spaceborne asset, and back to the ground inherently *transponds* the signal or includes a *transponder*, the Applicants point out that that definition was and is inconsistent with that which was understood by those of ordinary skill in the art. As described in "Telecommunications: Glossary of Telecommunications Terms," Federal Standard 1037C, dated August 7, 1996 (a copy of which is attached), a "transponder" is defined as follows:

> **transponder: 1**. An automatic device that receives, amplifies, and retransmits a signal on a different frequency. **2.** An automatic device that transmits a predetermined message in response to a predefined received signal. *Note:* An example of transponders is in identification-friend-or-foe systems and air-traffic-control secondary radar (beacon radar) systems. **3.** A receiver-transmitter that will generate a reply signal upon proper interrogation.

The Martin system does not conform to any of these definitions:

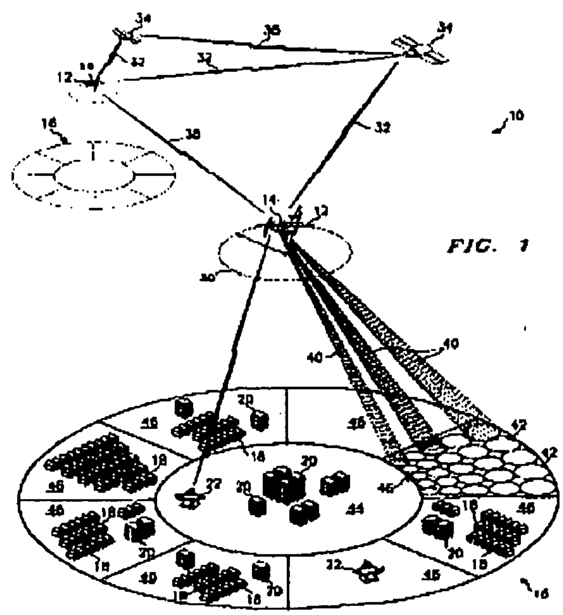


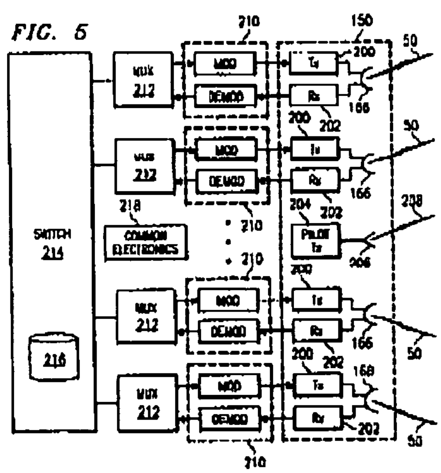
FIG. 1

The ASN (14) of the Martin reference includes a switching network 214 and a database 216 that are used to route messages from to the proper destination. This is described as follows:

> ASN 14 also includes a modem 210 and a multiplexer 212 for each transmit/receive pair 166 and gateway antenna 168. A switch 214 coupled to each multiplexer 212 provides interconnection of data in communication system 10. Switch 214 includes database 216 that stores information on each cell 42 in service region 16 and associated beams 40 formed by transmit/receive pairs 166 to service cells 42. Database 216 also maintains suitable customer, addressing, routing, and mapping information to perform asynchronous transfer mode (ATM) or other suitable packet switching technique. Database 216 may comprise random access memory (RAM), read only memory (ROM), magnetic or optical devices, or any other suitable memory. Common electronics 218 include power supplies, processors, and other hardware and software to support the operation of ASN 14.
>
> In operation, an originating device in an originating cell 42 transmits packet data over link 50 to ASN 14. Transmit/receive pair 166 forming an originating beam 40 servicing originating cell 42 passes the packet data to receive module 202 for down converting and suitable RF processing. Demodulator in modem 210 then extracts the digital packet data and passes this information to multiplexer 212. Using SONET or other suitable protocol, multiplexer 212 passes the packet data to switch 214 for routing.
>
> Switch 214 retrieves addressing or routing information from the packet data, associates this information with a particular subscriber or destination device, determines an associated destination cell 42, and determines a destination beam 40 servicing the destination cell 42. Upon determining destination beam 40, switch 214 routes the packet data to the appropriate multiplexer 212 servicing transmit/receive pair 166 that forms destination beam 40. Multiplexer 212 combines the packet data with other packet data to the same transmit/receive pair 166 and passes this information to the modulator in modem 210 for delivery to transmit module 200. Transmit/receive pair 166 communicates the modulated RF signal containing the packet data to destination cell 42 using destination beam 40. The destination device receives the packet data and translates the packet data into digital information for further processing. ASN 14 performs a similar operation for communication that involves gateway 22 and gateway antenna 168. (col. 9, lines 17-59)

and is illustrated in FIG. 5 below.

FIG. 5



The Martin reference teaches a system wherein the decision as to where the information is to be transmitted is made by the platform itself. This necessitates a rather large and complex

communication platform, and is not a characteristic of a bent pipe communication system using a *transponder*.

b) Lindenblad Does not Teach Separating the Platforms by 8.6 Times the Radius of the Flight Path of the Platforms

The Office Action alleges that Martin's platforms travel on a path having a radius of between 2.5 and 4 miles. Since claim 1 specifies that the separation between the platforms be approximately 8.6D, that would require that the spacing between platforms be 21.5 and 34.4 miles. The Office Action indicates that Linderblad teaches a distance between each platform of 400-600 miles. Linderblad plainly teaches away from the Applicants' invention.

c) There is No Teaching to Combine Martin and Linderblad

According to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made "to have multiple airctafts serving large service areas between the airplanes in order to provide adequate service to large areas set at a certain arbitrary distance with less interference and with better investment without the need for an excess of grand stations to provide the same service suggested by Lindenblad (col. 2, lines 8-16).

The Applicants respond that (a) Martin presumably offers all of the foregoing, so where is the motivation to modify Martin as described in Linderblad?; and (b) the foregoing does not address the real issue … why Lindenblad teaches Martin to alter the spacing between platforms.

4. Independent Claims 15, 18, 23, 28, 35, 37 and 39 are Patentable Over the Martin and Lindenblad References

Claims 15, 18, 23, 28, 35, 37 and 39 each recite features analogous to those of claim 1. Claim 15, 18, 23, 28, 35, 37 and 39 are therefore patentable for the same reasons.

B. Dependent Claims 2-14, 16, 17, 19-22, 24-27, 29-34, 36, 38, and 40-48 are Patentable Over The Prior Art

1. Dependent Claims 2, 3, 5-9, 12, 14, 16, 19-21, 25, 29-34, 36, 38, and 40-48 are Patentable Over the Martin and Lindenblad References

Claims 2, 3, 5-9, 12, 14, 16, 19-21, 25, 29-34, 36, 38, and 40-48 each recite the features of the claims they depend upon and are therefore patentable on the same basis. In addition, claims 2, 3, 5-

9, 12, 14, 16, 19-21, 25, 29-34, 36, 38, and 40-48 each recite additional features rendering them even more remote from the cited references.

a) Claims 41-48 are Patentable over the Martin and Lindenblad References

Claims 41-48 were rejected as unpatentable over Martin and Lindenblad. Claims 41-48 recite that the communications platforms are hexagonally packed. The Final Office Action admits that neither Martin Nor Lindenblad disclose this feature, but asserts that hexagonal packing is obvious because:

> "the lines of travel of a plurality of aircrafts together are well known to be able to go in separate lines of travel such as a first line followed by a second line of airplane, where the second line of airplane could comprise more airplanes than the first line based upon how many service regions are needed to be covered with that line of succession and so on. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to hexagonally pack the platforms of Martin et al and Lindenblad in order to only provide the minimum amount of airplanes sufficient to cover the service regions along that particular line of travel."

The Applicant responds that (a) even if all the foregoing weren't hindsight reconstruction, it still fails to explain how or why one would modify Martin and Lindenblad to arrive at hexagonal packing, (b) Lindenblad teaches arranging airplanes in long chains between endpoint destination, and hence teaches away from hexagonal packing, and (c) the foregoing *is* hindsight reconstruction. Accordingly, the Applicants respectfully traverse.

b) Claims 4 and 24 are Patentable over the Martin, Linderblad and MacDoran References

Claim 4 was rejected as unpatentable over Martin and Linderblad, and further in view of U.S. Patent No. 4,797,677, issued January 10, 1989 to MacDoran (hereinafter, MacDoran). The Applicants respectfully traverse.

(1) The MacDoran Reference

U.S. Patent No. 4,797,677, issued January 10, 1989 to MacDoran discloses a system that permits a user to derive his pseudo range from earth-orbiting, signal-transmitting satellites without knowledge of the code sequence of modulation carried by the signal. A modulated radio frequency signal having a component at a given frequency, which is transmitted from a satellite is intercepted at

a user position. The component is recovered from the intercepted signal. The phase and frequency of the component are measured. From these measurements and similar measurements from other such satellites, the pseudo range of the satellite can be derived. Specifically, a fractional phase is derived from the measured phase and frequency of the intercepted signal. A Doppler range value is also derived from the measured frequencies of the satellites. The Doppler range value is divided by the wavelength of the given frequency to produce an integer and a remainder. The integer is added to the fractional phase to produce a value proportional to the pseudo range.

(2) Claims 4 and 24 are Patentable Over the Martin, Linderblad, and MacDoran References

Claim 4 recites:

> *The communications system of Claim 1, wherein:*
> *the user terminal includes an unsteered user terminal antenna characterizable by a beamwidth; and*
> *the communications platform maintains an apparent position relative to the user terminal within the beamwidth of the user terminal antenna.*

According to the Final Office Action, Martin and Lindenblad do not disclose an unsteerable antenna, but MacDoran does. The Office Action further argues that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an unsteerable antenna in order to point the antenna in one direction from one point to another point directly at the desired station."

The Office Action relies on the following portion of the MacDoran reference:

> A tradeoff is therefore accomplished, that of abandoning a point positioning determination in which the geocentric position of the user (X.sub.u, Y.sub.u) and user clock offset (.DELTA.t.sub.u) is deduced, traded for the determination of the differential location of station 2 relative to station 1. Consider FIG. 2. The unit vector S is located at station 1 and points to the satellite signal source at a distance .rho..sub.1. The baseline vector B points from antenna 2 (phase center) to antenna 1 (phase center in the case of an unsteered omnidirectional antenna). (col. 44, lines 52-61)

The Applicants respectfully traverse, for several reasons.

First, claim 4 indicates that the antenna is characterizable by a beamwidth, and the MacDoran reference recites an *omnidirectional* antenna ... that is, one essentially without a beamwidth.

Second, the cited portion MacDoran reference refers to a GPS system that has GPS satellites in low or mid earth orbits (the satellites cross from horizon to horizon frequently), and which the ground stations (GPS receivers) receive data from satellites, but do not transmit data. Using an omnidirectional antenna is appropriate for such a system, but it would not be appropriate in a system that must transmit as well as receive information, and do so to satellites that are in no way stationary. In short, it is not possible to combine the teachings of MacDoran with a system such as is described in Martin. Surely, there is no teaching whatsoever to do so.

Finally, in rejecting this claim, the Final Office Action again explores deeply into the realm of hindsight reconstruction, simply picking and choosing limitations from references that are at best, only peripherally related to one another, and without regard for whether such a combination would have been suggested or even possible.

Claim 24 recites analogous features and is patentable for the same reasons.

VIII. CONCLUSION

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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